MINOS Control Room Computing

Operational Description and Support

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Overview

The Minos Control room is currently located on the 12th floor of Wilson hall and is in a shared space with other Intensity Frontier (IF) experiments. The control room serves as the central point for the monitoring and control of the Minos detectors. Shifts are conducted in the Control Room, or remotely via gateways in the Control Room.

The detectors can also be monitored and operated from the Control Room at the Far Detector , staffed 8x5.

The Control Room systems interact with the DAQ systems via gateway systems. Logging of data in the experiment by the DAQ systems is entirely independent of the Control Rooms.

The DAQ computing resources that acquire data from the Minos detectors are local to each detector. The Near detector is in the Minos detector hall at Fermilab. The Far detector is located at the Soudan Mine in northern Minnesota. In both cases the DAQ systems are isolated from the general network via appropriate firewalls and gateways. The DAQ process proceeds independent of the Control Room systems.

The Control Room computers run a limited number of special processes, including a Web server, a JIRA problem tracking system, the JAS beam monitor, and data quality monitoring processes. They also serve as a gateway for remote shift stations located offsite.

The Control Room machines are connected to the standard Fermilab public network, and are configured as standard workstations.

System Users

Shift activities on the control room machines use the minos account . Remote access to the this account is handled by inclusion of appropriate users in the .k5login file. This file is maintained by the experiment and is distributed to each of the control machines.

There are no private accounts on the CR systems.

A few experts have root access to the Control Room systems,
for operation and configuration of the servers mentioned above,
and to allow immediate diagnosis of problems.

Hardware Configuration

The Minos CR machines are mostly Dell Precision 670 systems with two to four monitors. We maintain a printed copy of the hardware configurations.

Software Configuration

We do not share file systems between CR machines.
The last of several former NFS exports were removed in early 2011.
Necessary common files are duplicated via rsync.

Each system's minos home directory contains a limited set of scripts which are used to start and stop DAQ services.

John Urish maintains archives in AFS of the important local files.
All other files on the control room machines are considered, temporary or non-persistent and do not need to be backed up, archived or in any other fashion preserved.

AFS is used to provide the base libraries for some applications.
Minos no longer uses AFS for offline computing, so this is a relic.
As of Spring 2011, we have demonstrated a non-AFS version of most of these programs, as documented in the Minos RMS package.
We will soon stop using AFS in the control room.

We run the same OS release and configuration on all systems.
For historical reasons, some systems have or had special roles, briefly outlined here.

minos-beamdata

Critical system, logs beam in formation necessary for data anlysis.

Located in FCC, for its reliable power and networking.

minos-beamdata2

Alternate beam data logger.

Administrative access to Minos Bluearc systems.

minos-gateway-nd

Critical system, provides communication to the DAQ systems.

We can take data without it for while, without monitoring or archiving.

minos-acnet

Once ran 'xhost' authorized X-windows for the ACNET console.

This now runs via an ssh tunnel, not unique to minos-acnet.

minos-evd

Once ran the prinary control room NFS server. This was retired.

Runs the interactive event display.

minos-om

Runs the control room Web server.

Acts as the gateway for ReMote Station access, for remote shifts.

Runs the Minos JIRA server.

minos-rc

Displays Run Control consoles , which could run anywhere.

minos-dcs

Windows systems, University of Minnesota responsibility.

Personnel

Operational decisions are made by the Run Coordinators.
The current run coordinators are listed on the blackboard in the Control Room, and are documented in the Memo Pad, https://cdcvs.fnal.gov/redmine/projects/minos-memopad/wiki

The Minos control room is staffed 24 hours per day, 7 days per week when beam is running to the experiment. The shifts are is staffed by individuals who has been trained in the basic operations of the data acquisition system. The shifter is not an expert with respect to the computing systems. We have written procedures for restarting our processes in the event of a reboot.

When the beam is not running to the detector, shifts may be cancelled. In this case, the Run Coordinators are responsible for operation of the detectors.

The Control Room is never left open and unattended.
The Control Room is locked whenever all four experiments are off shift.

Uptime Requirements

Maintenance must be scheduled in advance with the Run Coordinators.

We generally run auto-yum, but reboot only as scheduled.

minos-beamdata needs to operate 24x7,
with fallaback to minos-beamdata2.

The other systems are used for monitoring, but are not essential for data logging. Therefore, something like 8x7 support is appropriate,
with 8x5 for less critical functions.